Heart disease from the air we breathe

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Cardiovascular disease
Very common and the leading cause of death in the EU

**IMPACT OF CARDIOVASCULAR DISEASE**

**LIVING WITH CVD (EU)**
- **60 MILLION**
  - Total of people living with Cardiovascular Disease today
- **13 MILLION**
  - New cases of Cardiovascular Disease each year

**COSTS OF CVD (EU)**
- **€111 BILLION** Healthcare costs
- **€54 BILLION** Productivity loss
- **€45 BILLION** Informal care costs

**Overall Cost:**
- **€210 BILLION** per year

- **53%** of total cost
- **26%** of total cost
- **21%** of total cost
Cardiovascular deaths from air pollution across Europe

**PROPORTION OF AIR POLLUTION DEATHS FROM CARDIOVASCULAR DISEASE**

Cardiovascular disease: 48%

Other causes: 52%

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**Figure 2** Regional distribution of estimated annual excess mortality rates from cardiovascular diseases (CVD = IHD + CEV) attributed to air pollution. These rates are lower limits as other non-communicable diseases are not included.
How does air pollution affect your heart?

**Exposure**

- [Image of exposures]

**Disease processes**

- Blood vessel narrowing and clots
- Electrical disturbances

**Clinical outcomes**

- Heart failure
- Myocardial infarction
- Stroke
- Arrhythmias
Immediate coronary effects of diesel

![Graph showing ST-segment change (µV) over time from start of exposure (min). The graph compares air and diesel exposure, with diesel causing a more pronounced decrease in ST-segment change.]
Air pollution increases atherosclerosis

Filtered air

PM$_{2.5}$

(n=28 apoE$^{-/-}$ mice; 6 months, 6hr/day*5 day/week)
Air pollution and arrhythmias at very low levels

Atrial Fibrillation

Cardiac Arrest

Mean 4.7μg/m³
Air pollution affects a multitude of cardiovascular outcomes.
Conclusions

1. Cardiovascular diseases are the most common causes of death and disease in the EU with considerable impacts on health and related costs.

2. Air pollution contributes to a range of cardiovascular diseases as well as to a large proportion of all cardiovascular diseases.

3. Stricter control of air pollution offers an effective strategy that will prevent new disease, reduce suffering and save many lives from the consequences of cardiovascular disease in the EU.